DMS-8241, Removable Prefabricated Pavement Markings

Overview

Effective Date: June 2003 – July 2004.

This Specification governs for the materials, composition, quality, sampling, and testing of removable prefabricated pavement marking.

Bidders' and Suppliers' Requirements

Before any material is considered, it must be of manufacture and product code or designation shown on the Prequalified Products List maintained by the Department's General Services Division (GSD).

Payment

Payment for all materials will be in conformance with the provisions of the purchase order or Contract awarded by the State.

Prequalification and Performance History

Establishment of Performance History

Manufacturers who desire to prequalify and establish a performance history for their product must contact the Texas Department of Transportation, General Services Division, 125 East 11th Street, Austin, TX 78701-2483.

Manufacturers will be notified after their material has been evaluated. In addition to Specification requirements, all materials must pass the following road test before being placed on the list of prequalified materials.

- The Department will select locations within 80 km (50 mi.) of Austin, Texas.
- Locations may be in either straight or curved sections of roadways.
- Place material on the roadway as both longitudinal and transverse markings.

For the road and other prequalification tests, submit at no cost to the Department, a minimum of 46 m (150 ft.) of white 102-mm (4-in.) wide markings and 15 m (50 ft.) of yellow 102-mm (4-in.) wide markings.

- Transverse Markings
  - Place 3 transverse markings at each location 2.1 to 2.4 m (7 to 8 ft.) in length and approximately 102 mm (4 in.) apart.
- Longitudinal Markings

- Place 3 longitudinal markings, approximately 102 mm (4 in.) apart, 3.0 to 3.6 m (10 to 12 ft.) in length in each wheel path upstream to traffic and in the same traffic lane as the transverse markings.

♦ Test Locations

- Test locations must not be within 91 m (300 ft.) of an intersection or other location where traffic may be required to stop by a traffic control device installed on the roadway.

♦ Road Conditions

- Markings may be placed on either asphaltic or concrete pavements.
- The average minimum daily traffic (ADT) per lane must be 15,000.
- Make no distinction between truck and car traffic.

♦ Results

- Markings must remain in place, serviceable, distinctly reflective and removable in pieces no less than 0.6 m (2 ft.) in length, at temperatures above 4°C (40°F) without the use of heat, solvents, grinding, or blasting after passage of 1,200,000 vehicles. Base the time on the roadway test on the latest available ADT.
- Inspection and evaluation of results will be performed at the end of the roadway test.

Re-evaluation

When in the opinion of the Director of CST/M&P changes were made in the composition or manufacturing process of a prequalified material, a re-evaluation of the performance may be required.

The Department may conduct additional tests to identify changes in the material. Changes detected in the composition or in the manufacturing process and not reported by the manufacturer may be cause for removal of that material from the prequalified material list.

Periodic Evaluation

The Department reserves the right to evaluate periodically the performance of materials. Samples for periodic evaluation of performance will be selected at random from materials submitted to the Department on State purchase orders.

Failure of materials to comply with the requirements of this Specification may be cause for removal of those materials from the list of prequalified materials.

Sampling and Testing

The Department will sample in accordance with "Tex-732-I, Sampling Prefabricated Pavement Markings" and will test in accordance with the methods listed in 'Material Requirements.'

Material Requirements

General Requirements

Design the removable prefabricated pavement-marking film in a manner to facilitate easy removal from the roadway. Incorporate glass beads into the film to comply with the bead retention and reflective characteristics in this Specification.

Materials used in the manufacture and construction of the film are at the discretion of the manufacturer. Materials and construction of the removable prefabricated pavement-marking film supplied to the Department or to Contractors must remain the same as those used in the prequalification sample.

Precoat the back of the marking film with a pressure-sensitive adhesive suitable for affixing the markings to asphaltic or concrete pavements. The adhesive must not require heat, solvents, or any other means to activate adhesion of the material to roadway surfaces.

Dimensional Tolerance

Supply the material in the width, shape or shapes as specified, meeting the following requirements:

- All lengths and widths of shapes must be within 3 mm (1/8 in.) of those specified.
- Width of roll material shall be within three (3) mm (1/8 in.) of that specified.
- Thickness without adhesive shall not vary over -10% nor +25% of the average thickness determined on the prequalifying sample.

Color

The color of the pavement marking material must appear uniform. Its CIE Chromaticity Coordinates must fall within an area having the following corner points and meet the following brightness requirements:

CIE Chromaticity Coordinate Corner Points and Brightness Requirements

	1		2		3		4		Brightness
	x	y	x	y	x	y	x	Y	Y
White	.290	.315	.310	.295	.350	.340	.330	.360	Min. 65
Yellow	.470	.455	.510	.489	.490	.432	.537	.462	45-60

NOTE*:* The white and yellow pavement marking materials must meet the above specified color requirements for each color respectively before and after 70 hr. of exposure in a weather-o-meter. Weather-ometer exposure will be in accordance with ASTM "G 153, Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials," using Exposure Cycle 1 (18 min. for water spray in every 120 min. of light exposure). Prepare panels for testing with pavement marking materials supplied to the destination of goods address.

Resistance to Environmental Conditions

- Moisture
  - Apply the material to a clean, aluminum panel according to the manufacturer's instructions and allow to cure for 24 hr. at 16 to 27°C (60 to 80°F). Submerge the panel in water for 4 hr. and allow to dry. The material must show no deterioration, change in color, loss of reflectivity, nor loss of adhesion.
- Chemicals
  - Contact between the pavement marking material and calcium chloride or sodium chloride must not cause deterioration, change in color, nor loss of retroreflectivity of the material. Oil droppings from traffic must not deteriorate the material.
- Temperature
  - The pavement marking material shall retain its shape and integrity at all pavement temperatures between -18 to 71°C (0 and 160°F).
  - Determine pavement temperature in accordance with "Tex-829-B, Measuring Pavement Temperature."
- Bead Adhesion
  - When tested in accordance with "Tex-852-B, Determining Bead Adhesion of Pavement Marking Material," the rating must be excellent after 200 cycles.
- Retroreflectivity
  - The 'Brightness Values' table shows specific intensity (SI) requirements of the pavement markings.
  - Determine SI in accordance with "Tex-842-B, Measuring Retroreflectivity."
  - Determine the brightness values at an 86-degree entrance angle and the observation angles shown.
  - Express brightness values (SI) in units of lumens per lux per square meter (candlepower per foot-candle per square foot).

Brightness Values

		Specific Intensity	
Observation Angle		**1m/1x/m^2**	**(cp/ftc/ft^2)**
White	0.2°	1.63	(0.13)
	0.5°	1.26	(0.10)
Yellow	0.2°	1.26	(0.10)
	0.5°	0.75	(0.06)

- Chemical Analysis
  - The infrared and x-ray analysis of the face side of the markings must match those of the prequalified material. Determine infrared and x-ray spectra in accordance with "Tex-888-B, Obtaining the Infrared Spectrum of Organic Materials" and "Tex-896-B, Qualitative and Semi-Quantitative Analysis of Crystalline Material by X-ray Diffraction."
  - The infrared analysis of the adhesive must match that of the prequalified material.
- Storage
  - The material must meet the criteria of this Specification after being stored in a cool, dry indoor area for a period of 1 yr.

Archived Versions

Archived versions of "DMS-8241, Removable Prefabricated Pavement Markings" are available through the following links:

Click on 8241-0898 for the specification effective August 1998 through May 2003.